

**ON APPROXIMATE TRANSFORMATION-OPTICS BASED
ELECTROMAGNETIC INVISIBILITY**

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ABSTRACT

In my two lectures, I shall discuss the transformation optics based design of electromagnetic invisible cloaks from the inverse problems point of view. In order to avoid the difficulty posed by the singular structure required for ideal cloaking, we study the regularized approximate cloaking in prototypical models, for time harmonic Maxwell's equations in \mathbb{R}^3 and the scalar Helmholtz equations in \mathbb{R}^2 . In particular, as the regularization parameter converges to zero, i.e., as the approximate cloaking converges to the ideal one, we will see that different types of boundary conditions appearing at the interior of the cloaking interface. Some of them is of non-local pseudo-differential type.